Price and Sales Volume Patterns of Mobile Handsets and Technologies

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ABSTRACT

This article provides empirical evidence on the price and unit sales volume patterns of mobile handsets and mobile technologies, using data on the Finnish market. The prices and sales are studied on product category, product model, and product feature levels. The results show how the dynamic of prices and sales changed after the proliferation of smartphones. Otherwise, the dynamics seem to be relatively systematic supporting the use of simple assumptions in practical estimations. The median price of handset models decreases linearly, from 89% of the introduction price at peak sales in the fifth sales month to 47% in two years. For mobile handset features, a decreasing price pattern was also identified. After a 10% market share is reached, the decrease is on average 30 Euros per 10% market share change. The prices at feature takeoff were identified to be on average at 58% of introduction price.

Keywords: Mobile Handset, Mobile Industry, Mobile Technology, Price Pattern, Product Feature, Product Lifecycle

1. INTRODUCTION

Understanding and analysing price and sales volume patterns of high-technology products and the dynamics between them is increasingly important as innovation related to high-technology products is taking place at a high pace on several levels, including product categories (like mobile handsets), product models (like Apple iPhone 5s), as well as product features (like WLAN). Prices of new products are important determinants of how fast they spread in the market (Horsky, 1990) and what type of sales patterns the products have during their lifecycle (Golder and Tellis,
1997). Therefore, the timing and extent of price decreases are highly important decisions for product manufacturers.

Many researchers have studied product pricing and price patterns, but most of the research is on the theoretical side. Only few publications explore empirical price patterns (e.g., Hernández-Mireles, 2010; Nair, 2007). These previous studies have shown that product prices often experience a decreasing pattern, which can be either gradual or include sudden transitions. The price pattern is a combination of several forces, including competition, consumer valuations, consumer heterogeneity, as well as the evolution of costs and market saturation over time (Hernández-Mireles, 2010). For instance, increased competition pushes product vendors to decrease their prices more notably and frequently (Álvarez et al., 2006) to increase or sustain their existing market share. The experience curve effect - including learning, technological improvements, and economies of scale (Day and Montgomery, 1983) - decreases costs of production further enabling the decreasing price pattern. Furthermore, differences in consumer valuations (because of heterogeneity) enable the use of price skimming, where the initially high prices decrease when the willingness to pay of the potential market also drops. Because of these reasons, the declining price pattern is also theoretically the preferable one from the producer viewpoint in some conditions (e.g., Bayus, 1994b).

From product lifecycle viewpoint, one area of interest is to identify different turning points in the lifecycle, such as the takeoff point (Golder and Tellis, 1997; Agarwal and Bayus, 2002; Tellis, Stremersch, and Yin, 2003; Peres, Muller, and Mahajan, 2010), which is the point in time when the initial period with low diffusion and sales changes to fast growth. Golder and Tellis (1997) analysed 31 product categories from the US market introduced between 1898 and 1990. For products introduced after the Second World War, they identified that takeoff takes place six years after the start of sales, at 1.7% penetration, and 63% of the introduction price. However, no generally accepted definition for the takeoff point exists. Furthermore, literatures on product variety (Lancaster, 1990) and proliferation (Bayus and Putsis, 1999), dominant design and innovation diffusion theories (Cecere, Corrocher, and Battaglia, 2014; Rogers, 2003), and the diffusion of product features (Kivi, Smura, and Töyli, 2012; Riiksen, Smura, Kivi, and Töyli, 2013) could all benefit from empirical analysis of price and sales patterns of the product models and technology components.

Only few publications on empirical price and sales patterns have focused on the product feature level, which is increasingly important as several high-technology product categories are converging and becoming more multifunctional. In this sense, mobile handsets are an important and attractive product category to study. Mobile communications are one of the fastest spreading and most used high-technology products globally. In addition, the mobile handset market is highly competitive, with a large number of innovations introduced during the last two decades, from faster data transmission technologies to positioning and touch screen displays. On the other hand, even though mobile handsets are evolving into advanced computer-like devices, the products are more standardized than personal computers (Fehder, Nelling, and Trester, 2009). Whereas the possibility of retrofitting or replacing parts of a mobile handset is difficult, for personal computers it is easier to update, for example, a hard drive or the amount of memory. With new smartphones, even the battery is often non-replaceable, limiting the possibilities to update the product. Because retrofitting of new features is seldom, analysis of the sales and prices of the technologies equipped in the sold product models becomes possible. This type of business logic on integrated hardware features seems to be an increasing trend also with ultra-portable laptops, and is the prevalent model with many new product categories such as different types of wearable products. Therefore, the analysis of the already mature mobile handset market can provide understanding for the dynamics of prices and sales of also other new technology products.